Klasifikasi Jenis Sampah Pada Konveyor Menggunakan YOLO TINY

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Abstract

The problem of garbage management, especially in Indonesia, is becoming more pressing due to rapid population growth and urbanization. garbage consisting of organic, inorganic, and residual materials requires effective management to reduce negative environmental and health impacts. Manual garbage classification and separation processes are often time-consuming, and prone to errors. Automation technology in the garbage classification process is needed to improve the garbage management process. The proposed solution is an automated garbage classification system using Tiny's YOLOv4 algorithm integrated with ESP8266 to control the servo on the conveyor. The system involves collecting and labeling litter image data, model training with augmentation techniques, and implementation on a conveyor. The camera detects the garbage, and the classification results are used to drive the servo, separating the garbage into the appropriate path. Test results show that the YOLOv4 Tiny model achieved an average accuracy of 79.74% for organic garbage, 97.38% for inorganic garbage, and 89.92% for residual garbage. The system improves the accuracy of the garbage classification process, providing a better and environmentally friendly solution.

Keywords: ESP8266, Garbage classification, Conveyor, Garbage Management, YOLOv4 Tiny